PATENT COOPERATION TREATY

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INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference AZ06-008WOWW	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/KR 2006/000341	International filing date *(day/month/year)* 1 February 2006 (01.02.2006)	(Earliest) Priority Date *(day/month/year)* 1 February 2005 (01.02.2005)
Applicant LG ELECTRONICS INC.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**
   a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
      ☐ The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
   b. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see continuation of this first sheet.

2. ☐ **Certain claims were found unsearchable** (see continuation of this first sheet)

3. ☐ **Unity of invention is lacking** (see continuation of this first sheet)

4. With regard to the **title**,
   ☒ the text is approved as submitted by the applicant.
   ☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,
   ☐ the text is approved as submitted by the applicant.
   ☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in the continuation of this first sheet. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,
   a. the figure of the drawings to be published with the abstract is Figure No. 2
   ☒ as suggested by the applicant.
   ☐ as selected by this Authority, because the applicant failed to suggest a figure.
   ☐ as selected by this Authority, because this figure better characterizes the invention.
   b. ☐ none of the figures is to be published with the abstract.

Continuation of first sheet

1. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, the international search was carried out on the basis of:

Continuation No. IV:

Text of the abstract

(Continuation of item 5 of the first sheet)

A driving apparatus for a washing machine is disclosed. The driving apparatus includes a tub (2) containing washing water and provided with a drum (3) rotatably installed therein; a double rotor comprising an outer rotor (10) provided with magnets (11) supported by the inner surface thereof, and an inner rotor (20) installed at the inside of the outer rotor (10) and provided with magnets (21) supported by the outer surface thereof; an internal bearing (B1) fixed to the rear surface of the tub (2) for rotatably supporting the inner portion of a drum shaft (4) connecting the drum (3) and the double rotor; an external bearing supporter (60) provided with an external bearing (B2) for rotatably supporting the outer end of the drum shaft (4); and a stator (30) fixed to the rear surface of the external bearing supporter (60) so that the stator (30) is disposed between the outer rotor (10) and the inner rotor (20), and generating magnetic energy for rotating the double rotor by electrical energy supplied from the outside.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR 2006/000341

A. CLASSIFICATION OF SUBJECT MATTER
IPC[8]: ***D06F 37/30*** (2006.01); ***D06F 37/26*** (2006.01); ***H02K 16/02*** (2006.01)
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC[8]: D06F, H02K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPODOC, WPI, esp@cenet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2004/004098 A1 (AMOTECH CO., LTD) 8 January 2004 (08.01.2004) *page 35, line 23 - page 37, line 3; figs 9c, 15*	1-13
Y	DE 10040319 C1 (Whirpool Corp.) 27 September 2001 (27.09.2001) *col. 2, line 37 - col. 3, line 32; figs 1, 3*	1-4, 12, 13
Y	US 6049930 A (Hisano et al.) 18 April 2000 (18.04.2000) *col. 4, lines 51-60; col. 5, lines 20-46; figs 3, 11, 12*	1-3, 5-13

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
16 January 2009 (16.01.2009)	17 February 2009 (17.02.2009)

Name and mailing address of the ISA/ AT	Authorized officer
Austrian Patent Office Dresdner Straße 87, A-1200 Vienna	SCHWARCZKOPF József
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/KR 2006/001636

Patent document cited in search report	Publication date	Patent family member(s)			Publication date
KR A 2004020715		none			
EP A 1602768		DE	T2	60318676T	2009-01-15
		ES	T3	2307249T	2008-11-16
		ES	T3	2307106T	2008-11-16
		SI	T1	1428924T	2008-08-31
		DK	T3	1428924T	2008-05-19
		AT	T	394535T	2008-05-15
EP A 1477605		US	A1	2006230618	2006-10-19
		KR	A	20010037518	2001-05-15
		KR	A	20010037517	2001-05-15
		DE	T2	60015045T	2006-03-02
		US	A1	2005146235	2005-07-07
		US	A1	2005144990	2005-07-07

PATENT COOPERATION TREATY

To:

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PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing *(day/month/year)*	17 February 2009 (17.02.2009)
Applicant's or agent's file reference: AZ06-008WOWW	**FOR FURTHER ACTION** See paragraph 2 below
International application No.: PCT/KR 2006/000341	International filing date *(day/month/year)*: 1 February 2006 (01.02.2006)
	Priority Date *(day/month/year)*: 1 February 2005 (01.02.2005)
International Patent Classification (IPC) or both national classification and IPC: ***D06F 37/30*** (2006.01); ***D06F 37/26*** (2006.01); ***H02K 16/02*** (2006.01)	
Applicant: LG ELECTRONICS INC.	

1. This opinion contains indications relating to the following items:

- [x] Cont. No. I — Basis of the opinion
- [ ] Cont. No. II — Priority
- [ ] Cont. No. III — Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- [ ] Cont. No. IV — Lack of unity of invention
- [x] Cont. No. V — Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- [ ] Cont. No. VI — Certain documents cited
- [ ] Cont. No. VII — Certain defects in the international application
- [ ] Cont. No. VIII — Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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Continuation No. I

Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed.

Continuation No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims **1-13**	**YES**
	Claims **----**	**NO**
Inventive step (IS)	Claims **----**	**YES**
	Claims **1-13**	**NO**
Industrial applicability (IA)	Claims **1-13**	**YES**
	Claims **----**	**NO**

2. Citations and explanations:

The following documents have been cited in the search report:

D1: WO 2004/004098 A1
D2: DE 10040319 C1
D3: US 6049930 A

Document D1 relates to a radial core type double rotor brushless direct-current motor in which a double rotor structure is employed with inner and outer rotors which are doubly disposed and thus a stator core is completely divided. The motor includes a rotational shaft which is rotatably mounted on a housing of an apparatus, cylindrical inner and outer yokes which are rotatably mounted on the center of the housing, inner and outer rotors including a number of magnets which are mounted with the opposing polarities on the outer surface of the inner yoke and the inner surface of the outer yoke, and a number of cores assemblies which are installed between the inner and outer rotors in which a number of coils are wound around a number of division type cores, respectively.

Document D2 describes a drum bearing, for front-loading washing machine, has bearing sleeve formed as 2 injection moulded components moulded around respective roller bearings. The drum bearing has a drum shaft, attached to the washing machine drum, supported for rotation relative to the rear wall of the washing liquid container via a bearing sleeve and a pair of spaced roller bearings, with the bearing sleeve split into 2 sections between the roller bearings. The bearing sleeve sections are provided as plastics injection moulded components, moulded around the roller bearings. One of the bearing sleeve components can be formed integral with the washing liquid container rear wall. A method of manufacture for a drum bearing for a washing machine drum is also disclosed.

Document D3 discloses a washing machine with a rotatable tub in which an agitator is disposed. A tub shaft connected to the rotatable tub is mounted on a base for rotation. A clutch is mounted on the tub shaft to be reciprocally moved so that the clutch engages a clutch engagement hole of the base and an engagement protrusion of a motor rotor alternately. An operation lever mounted on the base is operated so that the clutch is reciprocally moved. The bottom of the base includes a region of rotational locus of the clutch. The region is flat except for the clutch engagement hole so that the clutch is prevented from engaging a portion other than the clutch engagement hole. A reed switch is mounted on the base to be turned on when detecting engagement of the clutch with the clutch engagement hole.

The present application relates to a driving apparatus for a washing machine that includes a tub containing washing water and provided with a drum rotatably installed therein; a double rotor comprising an outer rotor provided with magnets supported by the inner surface thereof, and an inner rotor installed at the inside of the outer rotor and provided with magnets supported by the outer surface thereof; an internal bearing fixed to the rear surface of the tub for rotatably supporting the inner portion of a drum shaft connecting the drum and the double rotor; an external bearing supporter provided with an external bearing for rotatably supporting the outer end of the drum shaft; ; and a stator fixed to the rear surface of the external bearing supporter so that the stator is disposed between the outer rotor and the inner rotor, and generating magnetic energy for rotating the double rotor by electrical energy supplied from the outside.

Neither of the prior art documents cited in the search report discloses a washing machine with a double rotor type motor including an internal bearing fixed to the rear surface of the tub supporting a drum shaft connecting the drum and the double rotor; an external bearing supporter provided with an external bearing, and a stator of the motor fixed to the rear surface of the external bearing supporter, consequently the subject matter of independent claims 1, 12 and 13 is new.

Nevertheless, document D1 discloses a double rotor type motor for a washing machine, document D2 describes two drum bearings separately mounted on, and D3 discloses separately mounted bearings as well, so the subject matter of claim 1 to lacks inventive step.

Neider of the dependent claims 2-11 contains any feature, which, combined with the features of any claim to which they refer, defines subject matter that meets the requirement for inventive step, because the features are disclosed in the above mentioned documents or considered to be obvious to a person skilled in the art as common general knowledge. Similarly, the subject matter of independent claims 12 and 13 lacks inventive step either.

Industrial applicability is given.
